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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.         | CONFIRMATION NO. |
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| 09/897,573  | 07/02/2001  | Richard J. Markle    | 2000.089400                 | 1243             |
| 23720   | 7590        | 01/11/2005           |                             |                  |
| WILLIAMS, MORGAN & AMERSON, P.C.<br>10333 RICHMOND, SUITE 1100<br>HOUSTON, TX 77042 |             |                      | EXAMINER<br>SMITH, ZANDRA V |                  |
|   |             |                      | ART UNIT                    | PAPER NUMBER     |
|   |             |                      | 2877                        |                  |

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/897,573

Applicant(s)

MARKLE ET AL.

Examiner

Zandra V. Smith

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,7-12,14,16-20,22,24-36 and 39-47 is/are rejected.
- 7) ☒ Claim(s) 2,4,6,13,15,21,23,37 and 38 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 5, 7, 27, 29, 32, 34, 42-45 are rejected under 35 U.S.C. 102(e) as being anticipated by *Ngyuen et al. (US 6,179,256,B1)*.

As to **claims 1, 27, and 45**, Nguyen discloses a lithography tool that includes:

providing a wafer (214) having a test structure comprising a plurality of intersecting lines (col. 8, lines 1-10);

illuminating a portion of the grid and measuring reflected light from the illuminated portion is provided by the optical microscope (col. 8, line 53); and

determining a dimension of the grid (col. 9, lines 1-10).

As to **claim 3**, Nguyen discloses everything claimed, as applied above, in addition one parameter of an operating recipe of the tool is determined (col. 9, lines 1-5).

As to **claim 5**, Nguyen discloses everything claimed, as applied above, in addition a parameter of the operating recipe of the tool is determined (col. 7, lines 40-58).

As to **claims 7, 29, and 34**, Nguyen discloses everything claimed, as applied above, in addition an optical microscope (col. 8, line 53) is used that inherently uses intensity reflection in its measurement.

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As to **claim 32**, Nguyen discloses a lithography tool that includes:  
a processing tool and metrology tool (col. 7, lines 62-65);  
providing a wafer (214) having a test structure comprising a plurality of intersecting lines  
(col. 8, lines 1-10);  
illuminating a portion of the grid and measuring reflected light from the illuminated portion  
is provided by the optical microscope (col. 8, line 53); and  
determining a dimension of the grid with a processor and determining one operating  
recipe (col. 9, lines 1-10).

As to **claims 42-44**, Nguyen discloses a lithography tool that includes:  
a test structure with a first plurality of line and second plurality of intersecting lines,  
defining a grid in the substrate layer (col. 8, lines 1-10 and figure 1).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all  
obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 8, 10-12, 14, 16, 18-20, 22, 24, 26, 28, 30-31, 33, 35-36, 40, 46, 47 are rejected  
under 35 U.S.C. 103(a) as being unpatentable over *Nguyen et al. (US 6,178,256 B1)* in view of  
*Stirton ( 6,614,540,B1)*.

As to **claims 2, 8, 28, 31, 33, 36, and 47**, Nguyen discloses everything claimed, as  
applied above, with the exception of comparison to a target profile, however to do so is well

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known as taught by Stirton. Stirton discloses a system for characterizing dimensional features of a grating structure that includes comparison to a target profile in a library (col. 2, lines 55-62). It would have been obvious to one having ordinary skill in the art at the time of invention to include a comparison to a target profile to ensure that the structure conforms to standards.

As to **claims 10, 18, and 26**, Nguyen and Stirton discloses everything claimed, as applied above, in addition Stirton discloses measurement of width, depth, and sidewall angle dimension (col. 8, lines 12-17). It would have been obvious to one having ordinary skill in the art at the time of invention to measure width, depth, and/or sidewall angle to ensure that the entire pattern corresponds to manufacture tolerances.

As to **claims 11, 19, 40, and 46**, Nguyen discloses a lithography tool that includes:

providing a wafer (214) having a test structure comprising a plurality of intersecting lines (col. 8, lines 1-10);

illuminating a portion of the grid and measuring reflected light from the illuminated portion is provided by the optical microscope (col. 8, line 53); and

determining a dimension of the grid (col. 9, lines 1-10). Nguyen differs from the claimed invention in that a reference comparison is not provided in the determination of the grid details, however to do so is well known as taught by Stirton. Stirton discloses a system for characterizing dimensional features of a grating structure that includes comparison to a target profile (col. 2, lines 55-62). It would have been obvious to one having ordinary skill in the art at the time of invention to include a comparison to a target profile to ensure that the structure conforms to standards.

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As to **claims 12 and 20**, Nguyen and Stirton disclose everything claimed, as applied above, in addition Nguyen includes the determination of one parameter of an operating recipe of the tool (col. 9, lines 1-5).

As to **claims 14 and 22**, Nguyen and Stirton discloses everything claimed, as applied above, in addition Nguyen provides determination of a parameter of the operating recipe of the tool (col. 7, lines 40-58).

As to **claims 16 and 24**, Nguyen and Stirton disclose everything claimed, as applied above, in addition an optical microscope (col. 8, line 53) is used that inherently uses intensity reflection in its measurement.

As to **claims 30 and 35**, Nguyen and Stirton discloses everything claimed, as applied above, in addition Stirton discloses the use of scatterometry (col. 1, line 12). It would have been obvious to one having ordinary skill in the art at the time of invention to provide a scatterometer since light from the pattern is scattered and the ability to measure the scattered light will provide a means to determine details of the pattern.

Claims 9, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nguyen et al. (US 6,178,256 B1)* in view of *Mita et al (4,547,895)*.

As to **claims 9 and 39**, Nguyen discloses everything claimed, as applied above, with the exception identifying a fault condition, however to do so is well known as taught by Mita. Mita discloses a pattern inspection system that determines a defect in the pattern (col. 3, lines 58-68). It would have been obvious to one having ordinary skill in the art at the time of invention to include means for determining a fault in the pattern to avoid the cost of substrate replacement or re-fabrication as a result of transferring a defective pattern.

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Claims 17, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nguyen et al.* (US 6,178,256 B1) and *Stirton* ( 6,614,540,B1) and further in view of *Mita et al* (4,547,895).

As to **claims 17 and 25**, Nguyen and Stirton disclose everything claimed, as applied above, with the exception identifying a fault condition, however to do so is well known as taught by Mita. Mita discloses a pattern inspection system that determines a defect in the pattern (col. 3, lines 58-68). It would have been obvious to one having ordinary skill in the art at the time of invention to include means for determining a fault in the pattern to avoid the cost of substrate replacement or re-fabrication as a result of transferring a defective pattern.

#### ***Allowable Subject Matter***

Claims 2, 4, 6, 13, 15, 21, 23, 37-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, taken alone or in combination, fails to disclose or render obvious, a system for determining grid dimensions that includes comparing to a library of reference reflection profiles, each reference profile having an associated grid dimension metric, the selecting step (claim 2), the particular parameter (claims 4, 6, 13, 15, 21, 23, 37-38), in combination with the rest of the limitations of the claims.

#### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*Plettner et al. (5,985,739).*

***Response to Arguments***

Applicant's arguments filed 04 November 2004 have been fully considered but they are not persuasive. Applicant's representative argues that Nguyen does not meet the limitations of the claim in that the grid of Nguyen does not include openings. Although, Nguyen fails to specifically state that the grid includes openings, Plettner (5,985,739) shows that in the creation of semiconductor structures a grid generally implies a layer penetrated by openings (col. 4, lines 40-45); therefore Nguyen inherently meets the claimed limitations.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

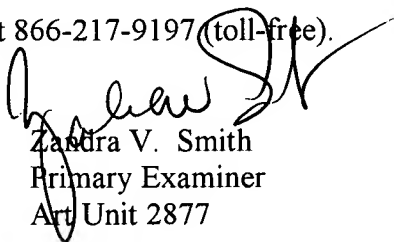
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Fax/Telephone Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zandra V. Smith whose telephone number is (571) 272-2429. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Zandra V. Smith  
Primary Examiner  
Art Unit 2877

January 6, 2005